oligoprogression or dominant tumour/local control. LC is highest for lung tumours which received the highest SBRT doses.

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IDENTIFICATION OF PATIENTS THAT WILL NOT BENEFIT FROM HEPATIC RADIATION
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Purpose: Primary hepatocellular (HCC) and secondary liver metastases (METS) is a growing problem. Despite the increasing use of liver stereotactic body radiotherapy (SBRT), there is a lack of a predictive model to understand which patients benefit from treatment. This study developed a model to improve patient selection for radical radiotherapy for liver malignancies.
Methods and Materials: Two hundred and twelve (HCC (31%), METS (69%)) patients were identified. We excluded those receiving low dose palliative radiation. Patients dying within four months were deemed to have failed to benefit from radiation. Both patient and tumour parameters were selected for univariate analysis. Patient factors included age, sex and liver function (Child-Pugh (CP) score, serum albumin (ALB), total bilirubin, prothrombin time, presence of ascites). Tumour factors included gross tumour volume (GTV), number of lesions, presence of extrahepatic disease (ED), previous treatments (resection, chemotherapy, chemoembolization) and primary disease site if metastatic. Multivariable regression analysis was used to develop a clinical predictive tool.
Results: For HCC, CP score and a larger GTV were found to be significant predictors of early death. For the METS group, ALB, presence of ED and colorectal primary were significant predictors. For the combined set, CP score (HR = 0.7), ALB (HR = 1.1), previous resection (HR = 5.2) and presence of ED (HR = 0.4) were significant predictors. Chi-squared analysis showed a significant ($p < 0.01$) reduction in deviance indicating that the model has good predictive value. ANOVA indicated that while each variable significantly reduced the residual deviance, the model is not saturated.
Conclusions: A model was developed to identify patients who are unlikely to benefit from radiation. The model is not saturated and additional variables need to be identified. Multi-institutional collaboration is required to obtain a larger sample size, as single centres are unlikely to obtain sufficient numbers for this disease site. Until then, all patients meeting commonly accepted liver SBRT eligibility should be offered radiation.

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OUTCOME OF RADIOTHERAPY FOR AGGRESSIVE FORMS OF BASAL CELL CARCINOMA OF THE HEAD AND NECK
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Purpose: Head and neck basal cell carcinoma (HN-BCC) is mainly managed by primary surgery. Radiotherapy (RT) is sometimes used for aggressive form BCC with adverse pathological features or occasionally as a definitive treatment alternative to surgery to enhance locoregional control (LRC). This study reviews outcome of HN-BCC following mega-voltage RT in our institution.
Methods and Materials: All HN-BCC received definitive or post-operative RT (PORT) between 1998 and 2014 were reviewed. Physician reported cosmetic outcome were recorded as a binary valuable ("good" or "poor"). Locoregional control (LRC), recurrence-free survival (RFS), and overall survival (OS) were calculated for all cases and for cases receiving definitive RT. Univariate analysis (UVA) assessed the association of tumour factors and LRC.
Results: A total of 111 consecutive HN-BCC were identified including 71 newly diagnosed and 40 recurrent BCC (rBCC). Median age was 76 years. All cases were aggressive form BCC with initial diameter > 1 cm (n = 109) patients, > 2 recurrence (n = 24) or extra-cutaneous extension (n = 30). Definitive RT (45-70 Gy at 1.8-4.5 Gy per fraction) was given in 73 (65.7%) cases for the following reasons: technically not suited for surgery (n = 20), cosmetic consideration (n = 42), and high operation risk due to age or comorbidities (n = 11). PORT (50-66 Gy at 1.8-2 Gy per fraction) was given in 38 cases for either adverse pathological features (compromised margins, deep invasion, and positive lymph nodes) (n = 26/38) or history of multiple recurrences (n = 14/38). Chemotherapy was only used in six (5.4%) patients in adjuvant setting. Median follow up was 4.7 years. Five-year LRC, RFS, and OS were 87%, 82%, and 93% for the entire cohort and 85%, 82%, and 96% for definitive RT subset. UVA revealed that rBCC [hazard ratio (HR) 8.03 (95% CI: 1.04-61.9), p = 0.04], primary arising from peri-orbital/peri-auricular region [HR 0.03 (1.06-9.13), p = 0.05], tumour size [HR 1.32 (1.08-1.61), p < 0.01], lymph node involvement (N+) [HR 3.7 (1.11-12.3), p = 0.03] and Stage III/IV [HR 3.16 (1.19-8.36), p = 0.03] were associated with increased risk of locoregional recurrence. Tumour size [HR 1.23 (1.02-1.47), p = 0.02] and N+ [HR 4.84 (1.57-14.95), p < 0.01] had a significant poor OS. Physician reported cosmetic outcome were good in 70/82 (85%) patients.
Conclusions: This study shows that RT is a valid alternative option for HN-BCC with a high LRC when used as single modality or in PORT setting with good overall cosmetic outcome. Recurrent tumour, size, nodal involvement and stage are associated with increased risk of recurrence.

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LONG-TERM PSA STABILITY AND PREDICTIVE FACTORS OF FAILURE AFTER PERMANENT SEED PROSTATE BRACHYTHERAPY
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Purpose: The Phoenix definition of biochemical failure (BF) (nadir+2) may overestimate cure rates after low dose rate prostate brachytherapy (LDR-PB). The purpose of this study is to assess long-term PSA stability after LDR-PB and predictive factors of eventual BF for those with a slowly rising PSA.
Methods and Materials: 2772 low or intermediate-risk prostate cancers underwent Iodine-125 LDR-PB monotherapy between 1998 and 2010. 49.7% received androgen deprivation (ADT) prior to LDR-PB (treatment policy: six months). Patients with less than 36 months follow up were excluded (n = 433). Clinical characteristics, dosimetric parameters and sequential PSA readings were retrieved from a prospective provincial database. A rising PSA was considered to be PSA ≥ 0.2 ng/mL with an increase ≥ 0.1 ng/mL over previous two years. The Phoenix definition was used to identify BF. Patients were classified as: 1) stable PSA (cured); 2) rising PSA (without BF); or 3) BF. The three groups were compared according to clinical, dosimetric and post-treatment parameters. Multivariate analysis was performed on the cured and failed groups to determine variables predicting for failure. Logistic regression model was applied with cross validation to test for model accuracy. ROC curves were obtained for patients with and without ADT to determine predictive cut-offs for BF.
Results: Median follow up is 89 months (37-199); median age at implant 66 years (43-84). Majority of patients (80.7%) had clinical Stage T1-T2a, 55% had Gleason score ≤ 6 and median baseline PSA was 6.5 ng/mL(0.3-40 ng/mL). 59% were intermediate-risk. Among the 2339 patients analyzed, 2004 (85.7%) had a stable PSA and were considered cured [median PSA at 60 months (PSA-60): 0.04ng/mL], 145 (6.2%) had a rising PSA (PSA-60: 0.27 ng/mL) and 190 (8.1%) had BF. PSA nadirs for the three groups were respectively 0.03 (cured), 0.16 (rising PSA) and 0.51 ng/mL (BF) ($p < 0.0001$). For patients with no prior ADT, the variables associated with failure are PSA nadir (OR: 20.6 $p < 0.0001$) and PSA-60 (OR: 18.3 $p < 0.0001$). If the model is applied to the rising PSA group, using a PSA-60 cut-off of 0.3 ng/mL (sensitivity: 85%,